Paper No. 29

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte YASMIN THANAVALA, CHARLES JOEL ARNTZEN and HUGH S. MASON

Appeal No. 2002-1901[1]
Application No. 09/464,416

ON BRIEF

Before WINTERS, SCHEINER and MILLS, Administrative Patent Judges.

SCHEINER, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the final rejection of claims 1-3 and 5-12, the only claims remaining in the application.

Claim 1 is representative:

1. A method for providing immune response in a mammal that is specific to an antigen to a non-enteric pathogen (NEPA), the pathogen being a pathogen that invades through a breach in the skin and that does not raise a protective enteric immune response in mammals free of acquired immunity to the pathogen in the absence of an oral adjuvant, said method comprising feeding the mammal with a substance comprising a physiologically acceptable material from a plant containing the NEPA, expressed by the plant, in combination with an orally effective adjuvant, said combination causing an immune response to oral administration specific to the NEPA stronger than a response specific to NEPA caused by the NEPA alone.

[1] As a preliminary matter, we note that this appeal is related to an appeal in application serial no. 09/420,695 (Appeal No. 2002-1543). We have considered the two appeals together.

The references relied on by the examiner are:

Arntzen et al. (Arntzen)	5,914,123	Jun. 22, 1999
Koprowski et al. (Koprowski)	5,935,570	Aug. 10, 1999

Stites et al. (Stites), in Basic and Clinical Immunology, 7th Ed., Appleton & Lange, USA, pp. 102 and 723-741 (1991)

Claims 1-3 and 5-12 stand rejected under 35 U.S.C. § 112, first paragraph (as based on a non-enabling disclosure), and also under 35 U.S.C. § 103 as unpatentable over Arntzen, Koprowski and Stites.

We reverse both the enablement and obviousness rejections.

DISCUSSION

Enablement

According to the examiner, "the specification [is] enabling for a method of providing an immune response in a mammal to hepatitis B surface antigen (HBsAg) . . . [but] does not reasonably provide enablement for providing an immune response to hepatitis C, hepatitis delta, yellow fever, dengue, hemorrhagic fever, tetanus . . . " (Answer, pages 3 and 4). The examiner concludes that "it would take undue experimentation . . . to determine which amounts of the instantly claimed plant materials expressing [these] non-enteric pathogen[s], . . . in combination with an orally effective adjuvant [ ] would have the claimed functional effect" (id., page 6).

While "enablement requires that the specification teach those in the art to make and use the invention without 'undue experimentation,' [the fact] [t]hat some experimentation may be required is not fatal; the issue is whether the amount of experimentation is 'undue.'" In re Vaeck, 947 F.2d 488, 495, 20 USPQ2d 1438, 1444 (Fed. Cir. 1991) (citation omitted, emphasis in original). "Whether undue

experimentation is needed is not a single, simple factual determination, but rather is a conclusion reached by weighing many factual considerations." In re Wands, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988).[2]

"[A] specification disclosure which contains a teaching of the manner and process of making and using the invention in terms which correspond in scope to those used in describing and defining the subject matter sought to be patented must be taken as in compliance with the enabling requirement of the first paragraph of § 112 unless there is reason to doubt the objective truth of the statements contained therein which must be relied on for enabling support." In re Marzocchi, 439 F.2d 220, 223, 169 USPQ 367, 369 (CCPA 1971) (emphasis in original). "[I]t is incumbent upon the Patent Office . . . to explain why it doubts the truth and accuracy of any statement in the supporting disclosure and to back up assertions of its own with acceptable evidence or reasoning which is inconsistent with the contested statement." Id. at 224, 169 USPQ at 370. Thus, "the PTO bears an initial burden of setting forth a reasonable explanation as to why it believes that the scope of protection provided by that claim is not adequately enabled by the description of the invention provided in the specification." In re Wright, 999 F.2d 1557, 1561, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993).

---

[2]

> Factors to be considered in determining whether a disclosure would require undue experimentation have been summarized by the board in Ex parte Forman [230 USPQ 546, 547 (BdPatAppInt 1986)]. They include (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims (footnote omitted).
>
> In re Wands, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988).

Accordingly, the dispositive issue here is not whether appellant has established that the disclosure is broadly enabling for the scope of the claims, rather, the issue is whether the PTO has met its "initial burden of setting forth a reasonable explanation as to why" it is not. Keeping this in mind, we consider the specific reasons provided by the examiner in support of his position.

The examiner argues that "the specification [does not] teach any methodology associated with [making] genetically altered plant materials expressing . . . NEPA" other than HBsAg; "the specification does not disclose . . . non-enteric pathogen antigens [other than HBsAg] which have been subjected to the claim-designated therapeutic regimen;" and "[a]ppellants would have to demonstrate the functional effect and describe the effective amounts of each ingredient . . . intended for therapeutic treatment" "[i]n order to enable . . . the invention as claimed" (Answer, pages 5 and 6).

In our view, the examiner has not provided a reasonable basis to question the adequacy of the disclosure provided for the claimed invention. First, the specification incorporates several references purporting to describe "[m]ethods for transforming plants to express HBsAg and other antigens" (Specification, page 8), which the examiner has not addressed in any way. Moreover, we know of no authority that would limit appellants to their working examples, simply as a matter of course, without evidence or reasoning of the kind discussed above on the part of the examiner. Instead of evidence or reasoning, however, we find conclusory assertions that "virology, microbiology, and immunology are highly unpredictable because there are too many unknowns in the claimed process for the skilled artisan to be able to practice the invention at the claimed scope," and "[e]ffective treatments for providing immunological

responses to the instantly disclosed pathogens are relatively rare, and may be unbelievable in the absence of supporting evidence" (Answer, pages 5-6).

Without belaboring the record, we will simply say that the examiner would improperly shift the burden of going forward to appellants, without having first discharged his own burden by backing up his assertions with acceptable evidence or a fact based analysis in keeping with that described in Wands. Accordingly, the rejection of the claims under the first paragraph of 35 U.S.C. § 112 is reversed.

Obviousness

Arntzen describes vaccinating animals against hepatitis B by feeding them transgenic plant material containing hepatitis B surface antigen (HBsAg), but does not describe administering the oral vaccine in combination with an adjuvant. The examiner argues that "it would have been obvious to one of ordinary skill in the art to combine the [non-enteric pathogens (NEPA)] taught by Arntzen with an adjuvant" (Answer, page 8) because Koprowski "teaches that when the plant material containing the NEPA is delivered, it can be delivered with an adjuvant to facilitate or improve its immunological therapeutic activity," while Stites teaches that "adjuvants enhance the response of an immunigen . . . [when] administered in combination with the immunogen" (id., page 9).

Viewing Koprowski and Stites in their entirety, however, we cannot agree that either reference would have suggested combining an adjuvant with an oral vaccine. Koprowski describes synthesis of bioactive compounds, including immunogenic compounds, in plants infected with transformed Clavibacter xyli. According to Koprowski, "[t]he route of administration . . . can be either parenteral or through any mucosal surface, including the oral pharynx, nasal cavity and digestive tract" (column 5,

lines 43-45). "[W]here there is no [ ] purification step or steps, the bioactive compound . . . is normally administered . . . by feeding (i.e., oral route of administration) [the raw plant] to the animal" (column 5, lines 50-56). Koprowski does teach that adjuvants can facilitate or improve the immunogenic activity of the bioactive compound (column 6, lines 33-36), but not, apparently, in the context of oral vaccine administration. Indeed, Koprowski describes experiments wherein mice were immunized with a bioactive compound orally or by injection; an adjuvant was used whenever the bioactive compound was administered by injection, but never when it was administered orally. See Examples 2 and 3.

Similarly, Stites merely teaches that "[a] quantity of antigen that is ineffective when injected intravenously may evoke a copious antibody response if injected subcutaneously in adjuvant," and that "[a]djuvants function in one or more of the following ways: (1) by prolonging retention of the immunogen, (2) by increasing its effective size, or (3) by stimulating the influx of . . . macrophages and/or lymphocytes" (page 102). The examiner has not explained how these teachings are relevant to orally administered vaccines.

Clearly, the examiner has established that individual parts of the claimed invention were known in the prior art. However, as explained in In re Kotzab, 217 F.3d 1365, 1369-70, 55 USPQ2d 1313, 1316 (Fed. Cir. 2000) (citations omitted):

> A critical step in analyzing the patentability of claims pursuant to section 103(a) is casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in the field. [ ] Close adherence to this methodology is especially important in cases where the very ease with which the invention can be understood may prompt one "to fall victim to the insidious effect of a hindsight syndrome wherein that which only the invention taught is used against its teacher." [ ]

> Most if not all inventions arise from a combination of old elements. [ ] Thus, every element of a claimed invention may often be found in the prior art. [ ] However, identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention. [ ] Rather, to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant.

"It is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious." In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992), citing In re Gorman, 933 F.2d 982, 987, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991). The examiner may establish a case of prima facie obviousness based on a combination of references "only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references." Id., 972 F.2d 1260, 1265, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992).

The fact that the prior art could have been modified in a manner consistent with appellants' claims would not have made the modification obvious unless the prior art suggested the desirability of the modification. In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). On this record, the only reason or suggestion to combine the references in the manner claimed comes from appellant's specification.

Nor are we persuaded by the examiner's assertion that "one of ordinary skill would have had a reasonable expectation of success that feeding an individual with an oral vaccine[,] . . . which further comprises an adjuvant[,] would provide a stronger

specific response to the NEPA than [that] caused by the NEPA alone" (Answer, pages 9-10). An expectation of success is an element in a prima facie case of obviousness, but it is not enough in the absence of a reason to modify the references in the first place.

The rejection of claims 1-3 and 5-12 under 35 U.S.C. § 103 is reversed.

Sherman D. Winters
Administrative Patent Judge

Toni R. Scheiner
Administrative Patent Judge

Demetra J. Mills
Administrative Patent Judge

) BOARD OF PATENT
) APPEALS AND
) INTERFERENCES

Simpson & Simpson PLLC
5555 Main Street
Williamsville NY 14221